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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/840,000	04/19/2001	Vi-En Choong	A-70204-1/RMS/BTC	5054

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EXAMINER
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SISSON, BRADLEY L

ART UNIT	PAPER NUMBER
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1634

DATE MAILED: 01/17/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/840,000

Applicant(s)

CHOONG ET AL.

Examiner

Bradley L. Sisson

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1634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 August 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 16-19,21-24 and 26-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-19,21-24 and 26-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

1. Claim 19 is objected to because of the following informalities: In line 1 of said claim there appears "smicrolocations." Perhaps applicant had intended --microlocations--.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 15, 17, 19, 21, 22, 24, 27 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Hogan et al. (WO 97/18226).

4. Hogan et al., teach at length the development and use of a wide variety of solid supports for nucleic acid-based assays wherein an electrostatic field is generated and is used to enhance hybridization specificity. As seen at pages 5-6, 10 and 13, a variety of support materials are disclosed. The aspect of synthesizing arrays of nucleic acid probes is also disclosed; see pages 11-12.

5. Page 18, first paragraph, teaches explicitly "the electrostatic field created on the surface of a solid substrate by the hybridization surface can be used to enhance the selectivity of duplex

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binding due to the interaction between the mismatches in the target, the probe and the electrostatic field of the surface.”

6. Page 15 discloses mixing the sample solutions with the device as well as using washing steps to remove non-target nucleic acid molecules. Such washing steps can be used to effect changes in pH or ionic changes which will in turn impact the electrostatic charge of the device; see also page 16, last paragraph, bridging to page 17. Such introduction and mixing of solutions is considered to meet the limitations of claims 21 and 27 wherein a mixing motion is produced.

7. The aspect of generating an array of probes bound to discrete surface areas is found at page 20-21. Such a showing is considered to meet a limitation of claim 24.

8. For the above reasons, and in the absence of convincing evidence to the contrary, the disclosure of Hogan et al., is considered to anticipate the invention of claims 15, 17, 19, 21, 22, 24, 27 and 28.

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

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the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 15-17, 19, 21-22, 24 and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hogan et al., in view of Beattie (US Patent 5,843,767).

12. Hogan et al., teach at length the development and use of a wide variety of solid supports for nucleic acid-based assays wherein an electrostatic field is generated and is used to enhance hybridization specificity. As seen at pages 5-6, 10 and 13, a variety of support materials are disclosed. The aspect of synthesizing arrays of nucleic acid probes is also disclosed; see pages 11-12.

13. Page 18, first paragraph, teaches explicitly “the electrostatic field created on the surface of a solid substrate by the hybridization surface can be used to enhance the selectivity of duplex binding due to the interaction between the mismatches in the target, the probe and the electrostatic field of the surface.”

14. Page 15 discloses mixing the sample solutions with the device as well as using washing steps to remove non-target nucleic acid molecules. Such washing steps can be used to effect changes in pH or ionic changes which will in turn impact the electrostatic charge of the device; see also page 16, last paragraph, bridging to page 17. Such introduction and mixing of solutions is considered to meet the limitations of claims 21 and 27 wherein a mixing motion is produced.

15. The aspect of generating an array of probes bound to discrete surface areas is found at page 20-21. Such a showing is considered to meet a limitation of claim 24.

16. Hogan et al., do not disclose the support as being “porous.”

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17. Beattie discloses the manufacture and use of arrays of nucleic acid probes on a porous support.

18. Beattie, column 1, teaches that use of a porous support results in "improved detection sensitivity due to the vastly increased surface area which increases the quantity of nucleic acid bound per cross sectional area.

19. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to have modified the method of Hogan et al., with the use of porous supports as disclosed by Beattie as such would have allowed for improved detection sensitivity. In view of the well-developed state of the related art, the ordinary artisan would have had a most reasonable expectation of success.

20. Claims 18 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hogan et al., and Beattie as applied to claims 14-17, 19, 21, 22, 24, and 26-28 above, and further in view of Drmanac et al.

21. See above for the basis of the rejection as it pertains to the disclosures of Hogan et al., and Beattie.

22. Neither Hogan et al., nor Beattie disclose reprobing an array.

23. Drmanac et al., column 5, third paragraph, disclose performing reprobing of an array at least one time.

24. It would have been obvious to one of one of ordinary skill in the art at the time that the invention was made to have repeatedly probed an array of nucleic acids as disclosed by Drmanac et al., as such would have allowed for greater amounts of information to be extracted fro a single set of nucleic acids, thereby reducing costs associated with the manufacture of additional arrays

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of probes. In view of the detailed guidance provided, and the explicit motivation found in the art, the ordinary artisan would have been motivated and in possession of sufficient motivation to perform such a combination of steps.

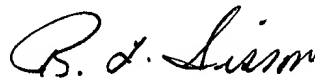
25. For the above reasons, and in the absence of convincing evidence to the contrary, the invention of claims 18 and 23 is rendered obvious by the prior art of record.

***Conclusion***

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bradley L. Sisson whose telephone number is (703) 308-3978. The examiner can normally be reached on 6:30 a.m. to 5 p.m., Monday through Thursday.


27. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, W. Gary Jones can be reached on (703) 308-1152. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9307 for After Final communications.

28. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.



Bradley L. Sisson  
Primary Examiner  
Art Unit 1634

BLS  
January 6, 2003



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